REMARKS

Response to the Finalization of Restriction Requirement

In the November 30, 2004 Office Action, the Examiner finalized the previously imposed restriction requirement.

In response, Applicants hereby make of record of the intention to rejoin the non-elected Group II method claims 42-166 upon allowance of the elected Group I product claims 1-41, consistent with the Office guidelines of MPEP Section 821.04. Correspondingly, the non-elected method claims 42-166 are maintained herein for future rejoinder.

Response to the §102 and §103 Rejections of Claims 1-41

In the November 30, 2004 Office Action, the Examiner rejected claims 1-41 on reference grounds. Specifically, the Examiner rejected:

Claims 1-10 under 35 U.S.C. §102(b) as being anticipated by **Heitz** et al., Excited States of Fe^{3+} in GaN, PHYSICAL REVIEW B., Vol. 55, No. 7, pp. 4382-4387 (Feb. 15, 1997) (hereinafter "Heitz");

Claims 11-13, 15-29, and 31-38 under 35 U.S.C. §103(a) as being obvious over **Heitz**;

Claim 30 under 35 U.S.C. §103(a) as being obvious over **Heitz** in view of **Heikman** et al. Growth of Fe Doped Semi-Insulating GaN by Metalorganic Chemical Vapor Deposition, APPLIED PHYSICS LETTERS, Vol. 81, No. 3, pp. 439-441 (July 15, 2002) (hereinafter "Heikman"); and

Claims 14 and 39-41 under 35 U.S.C. §103(a) as being obvious over **Heitz** in view of **Cuomo** et al., U.S. Patent No. 6,692,586 (hereinafter "Cuomo").

Applicants respectfully traverse the Examiner's rejection of claims 1-41, for the following reasons.

Claim 1, from which claims 2-41 depend, requires:

"**Large-area, single-crystal semi-insulating gallium nitride.**"

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The term "**large-area**" has been expressly defined by instant specification as "**ha[ving] a diameter of at least 25 millimeters, or in the case of square or rectangular wafers, a diagonal dimension of at least 25mm**" (see instant specification, page 6, paragraph [0022], lines 1-3).

As suggested in the background section of the instant specification, other have **tried but were not unsuccessful** in forming semi-insulating single-crystal GaN material of large-area (see instant specification, page 3, paragraphs [0005] and [0006]).

Therefore, the required large-area characteristic of the semi-insulating single-crystal GaN material, i.e., having a diameter of at least 25 millimeters, is NOT an optimum or workable range that can be achieved by routine experimentation, despite the Examiner's assertion in the November 30, 2004 Office Action (see Office Action, page 7, paragraph 44).

Instead, **such large-area characteristic of the semi-insulating, single-crystal GaN material is an innovative improvement achieved by the present invention that is incapable of achievement by the prior art**.

Nothing in the Heitz or the Heikman reference teaches or suggests that formation of a large-area, single-crystal semi-insulating gallium nitride, as expressly required by claims 1-41 of the present application.

The Cuomo reference teaches use of $M^{III}N$ columns for growth of continuous, low defect-density GaN layer that are n-type or p-type (see Cuomo, column 14, lines 22-27), but **it does not in any manner teach or suggest formation of semi-insulating gallium nitride**, as expressly required by claims 1-41 of the present application.

More importantly, **the Heitz, Heikman, and Cuomo references do not in any manner provide any suggestion or motivation for combining the teachings of Cuomo with those of Heitz or Heikman**. Therefore, the hypothetical combination of such references suggested by the Examiner is derived solely from improper hindsight of the present invention and cannot be used to support a *prima facie* case of obviousness.

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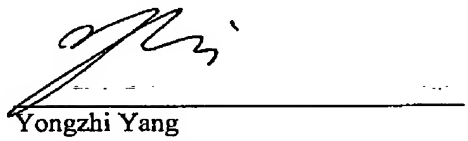
Based on the foregoing, Applicants respectfully request the Examiner to reconsider, and upon reconsideration to withdraw, the rejections of claims 1-41.

The Office is hereby authorized to charge any additional fees determined to be properly payable for entry of this Response, to Deposit Account 08-3284 of Intellectual Property/Technology Law.

If any issues remain outstanding, incident to the formal allowance of the application, the Examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss same, in order that this application may be allowed and passed to issue at an early date.

Respectfully submitted,



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